Family Astronesthidae

Body rather elongate. Head compressed. Mouth large. Mandibular barbel present, very long, free at tip, sometimes absent. Maxillary forms edge of upper jaw. Teeth in jaws pointed, unequal. Teeth on gill arches well developed, often in pairs. Post-temporal impinging on occiput. Opercles narrow. Vertebrae and neural spines normal, not protruding before dorsal fin. Body naked. Postocular luminous organ present. Photophores present. Dorsal above or behind vent, before anal. Adipose fin usually present. Pectorals low,

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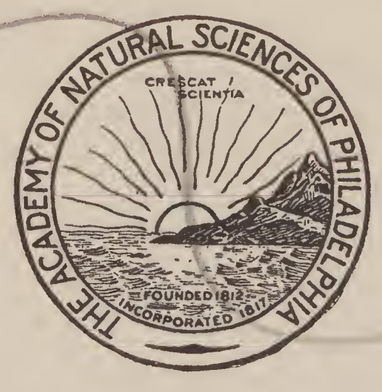

LOGAN SQUARE
PHILADELPHIA, PA.

Ventrals median or postmedian.

Small fishes of the deep seas.

The following imperfectly described form, immature?, may be a member of this family:

Genus Gymnoscopelus Günther

Gymnoscopelus Günther, Journ. Mus. Godeffroy, vol. 1, pt. 4, no. 4, 1873, p. 91 (267). Type Gymnoscopelus aphya Günther, monotypic.

Gymnoscopelus aphya Günther

Gymnoscopelus aphya Günther, Journ. Mus. Godeffroy, vol. 1, pt. 4, no. 4, 1873, p. 91 (267).

S. 50° W. 85°, near Magellan Strait.

Depth 4 1/2; head 4. Eye 3 1/2 in head.

Naked. Along median line of side, in arch off of lateral line, row of very thin small scales.

Head without luminous organs. Along each side of belly row of phosphorescent bodies, on trunk centrum pearl glazed, on tail a small black spot. Only on body row of spots double. On upper edge of tail row of black spots.

D. 12; A. 13; ventral inserted below front half of dorsal, nearer snout tip than caudal base.

Whitish, with myomeres as in Leptocephalus. Length 31 mm. (Günther.)

Near Magellan Strait.

Analysis of genera

a.' Astronesthinae. Teeth on gill arches short few, none on ceratohyal.

b.' Maxillary teeth directed obliquely backwards. Astronesthes.

b.² Maxillary long, with row of erect curved teeth, ' body moderately long.

c.' Photophores nearly equidistant.

d.' Postocular luminous organ single; maxillary teeth 6 to 10. Borostomias.

d.² Postocular luminous organ double; maxillary teeth 12 to 16 in adult. Diplolychnus.

c.² Photophores mostly in linear groups; maxillary teeth small and numerous. Heterophotus.

b.³ Maxillary short, with few minute

teeth; body very elongate.
Rhadinesthes.

a.[2] Hementhinal. Teeth on gill arches numerous, long, slender, nearly setiform; series of similar teeth on ceratohyal.
Hemesthes.

Genus Astronesthes Richardson

Astronesthes Richardson, Zool. Voyage Sulphur, Fishes, 1844, p. 97. Type Astronesthes nigra Richardson, monotypic.

Stomiatodon Bleeker, Verhandel. Batavia. Genootsch. (Bali), vol. 22, 1849, p. 10. Type Stomiatodon chrysophekadion Bleeker, monotypic.

Phaenodon Lowe, Proc. Zool. Soc. London, vol. 18, 1850, p. 250. Type Phaenodon ringens Lowe, monotypic.

Bathylychnus Brauer, Zool. Anzeiger, vol. 26, No. 668, 1902, p. 289. Type Bathylychnus cyaneus Brauer, monotypic.

Body compressed. Snout moderate. Eye not longer than snout. Mouth wide, cleft straight, lower jaw prominent. Upper teeth with 4 long curved canines, front of lower jaw with 2. Maxillary teeth fine, subequal, directed obliquely backward. Pair of teeth on vomer. Palatines with single row of small pointed teeth, like those on tongue. Gill rakers minute. No pseudobranchiae. Branchiostegals 24. No air vessel. Post-temporal triangular plate. Stomach large.

A small single luminous organ below eye. Sides and body covered with very small photophores. Dorsal fin rather long. Caudal forked. Paired fins long.

Analysis of species

a.' Dorsal 11, begins far behind ventrals, ends short space before anal. splendidus.

a.² Dorsal 10 to 14, begins behind ventrals, ends well before anal.

b.' Dorsal 12 to 14; caudal photophores continuous series; eye less than 3 in head.

c.' Dorsal begins well behind ventrals.

d.' Postocular luminous organ close to eye; eye 5 to 6 in head (specimens 20 to 62 mm.). filifer.

d.² Postocular luminous organ close to eye; eye 3 3/4 in head (specimen 145 mm.). oculatus.

d.³ Postocular luminous organ remote from eye. caulophorus.

c.[2] Dorsal begins little behind ventrals.

e.[1] Anal rays 19 to 21. similis.
e.[2] Anal 15; barbel 1/2 head, ending in bulb. luetkeni.
e.[3] Anal 13; barbel shorter than head, tapering. richardsoni.

b.[2] Dorsal 10 to 13; caudal photophores 10 to 13, 2 or 3 (sixth to ninth) above level of others; eye less 3 in head.

f.[1] Anal 19 to 22; ventral photophores 17 or 18 between pectoral and ventral, 18 to 20 between ventral and anal. martensii.

f.[2] Anal 19 to 20; ventral photophores 18 to 20 between pectoral and ventral, 21 to 24 between ventral and anal. lucifer.

f.[3] Anal 12 to 16. ijimai.

b.[3] Dorsal 12; Anal 20; eye 1/3 of head (specimen 115 mm.). chrysophekadion.

a.[3] dorsal 15 to 17, begins above ventrals and ends before anal; Anal 16 to 19; ventral photophores 17 to 19 between pectoral and ventral, 27 or 28 between ventral and anal.

gemmifer.

a.[4] dorsal 14 to 21, begins above or behind ventrals, extends above anal origin, or nearly, or beyond; Anal 12 to 17; ventral photophores 5 to 19 between pectoral and ventral, 8 to 21 between ventral and anal.

g.[1] Ventral photophores 17 to 19 between pectoral and ventral, 17 or 18 between ventral and anal.

h.[1] Barbel slender, black, with tapering white tip. cyclophotus.

h.[2] Barbel stout, compressed, white. neopogon.

g.[2] Ventral photophores 12 to 15 between pectoral and ventral,

17 to 21 between ventral and anal.

i.[1] Dorsal 14 to 18; adult with luminous patch on shoulder. niger.

i.[2] Dorsal 16; adult with luminous patches in pelvic region and on tail, not on shoulder. boulengeri.

i.[3] Dorsal 18 to 21; luminous patch on opercle. cyaneus.

g.[3] f Ventral photophores 10 or 11 between pectoral and ventral, 13 to 15 between ventral and anal.

j.[1] Anal 17. leucopogon.
j.[2] Anal 13. longiceps.

g.[4] f Ventral photophores 5 or 6 between pectoral and ventral, 8 or 9 between ventral and anal. indicus.

b.² Dorsal 10 to 13; caudal photophores 10 to 13, 2 or 3 (sixth to ninth) above level of others; eye less 3 in head.

c. Anal 19 to 22; ventral photophores 17 or 18 between pectoral and ventral, 18 to 20 between ventral and anal.

Astronesthes splendidus Brauer

Astronesthes splendidus Brauer, Zool. Anzeiger, vol. 25, 1902, p. 288. South of Ceylon, 2000 meters. — Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 14, fig. 2 (compiled).

Astronesthes martensi (not Klunzinger) Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee-Fische, 1906, p. 32, pl. 2, fig. 4 (type from N. 4°56' E. 78°15'3"). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 34 (part).

Depth 6 1/5; head 4 2/5. Eye 4 3/3 in

Genus Gonostoma Rafinesque

Gonostoma Rafinesque, Indice Itt. Sicil.,
1810, p. 64. Type Gonostoma denudata
Rafinesque, monotypic.

Sigmops Gill, Proc. A. N. Nat. Inus.,
vol. 6, 1883 (1884), p. 256. Type Sigmops
stigmaticus Gill, monotypic.

head; barbel little longer than head, with elongate white bulb having black spot at its tip bearing 8 fine terminal filaments.

Postocular luminous organ conspicuous, well separated from eye. Lateral photophores 37 between gill opening and anal. Ventral series 10 between isthmus and pectoral, 17 between pectoral and ventral, 20 between ventral and anal, 12 between anal and caudal.

D. 11, begins well behind ventral, end little before anal; A. 18; pectoral 18; ventral 7, slightly premedian. Dorsal adipose fin and long low ventral adipose fin.

Length 31 mm. without caudal.

(Regan and Trewavas.)

Indian Ocean.

Astronesthes filifer Regan and Trewavas

Astronesthes filifer Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., no. 5, May 30, 1929, p. 14, pl. 1, fig. 1. N. 5° to 19° W. 23° to 73°, 50 to 6000 meters, Atlantic and Caribbean Sea).

— Norman, Discovery Rep., vol. 2, 1930, p. 306 (N. 4°33'15" W. 16°52'45").

Lütken, Vidensk. Meddel. Dansk. Naturh. Foren. Köbenhavn, ser. 6, vol. 8, 1892, p. 277, fig. (N. 17° W. 22°, off Cape Verde Islands).

Astronesthes martensi Pappenheim, Deutsch. Südpolar Exped., vol. 15, pt. 2, 1914, p. 167 (N. 0°46' W. 18°59', 3000 meters). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, dec. 30, 1927, p. 34 (N. 24° W. 75° to 77°, 6000 to 8000 feet).

Astronesthes filifer Regan and Trewavas

Astronesthes filifer Regan and Trewavas,
Danish Dana Exped. Oceanogr. Rep., no.
5, May 30, 1929, p. 14, pl. 1, fig. 1, N. 5° to
19° W. 23° to 73°, 50 to 6000 meters, Atlantic
and Caribbean Sea. ✓

Astronesthes martensii (not Klunzinger)
Lütken, Danske. Videnskb. Selsk. Skrift.
Köbenhavn, ser. 6, vol. 8, 1892, p. 277,
fig. (N. 17° W. 22°, off Cape Verde Islands).
Astronesthes martensi Pappenheim, Deutsch.
Südpolar Exped., vol. 15, pt. 2, 1914, p. 167
(N. 0° 46' W. 18° 59', 3000 meters). — Parr,
Bull. Bingham Oceanogr. Collection, vol. 3,
art. 2, dec. 30, 1927, p. 34 (N. 24° W. 75° to 77°,
6000 to 8000 feet).

Depth 6 to 8; head 3 3/4 to 4 1/2. Eye 5 to 6 in head; 2 or 3 palatine teeth each side; white barbel tapering, 2/3 of head, less in young.

Postocular luminous organ very close to eye. Lateral photophores 14 or 15 between gill opening and ventral, 19 to 22 between ventral and anal. Ventral series 10 or 11 between isthmus and pectoral, 15 to 17 between pectoral and ventral, 19 to 22 between ventral and anal, 11 or 12 between anal and caudal. About 4 small white spots between postocular luminous organ and preopercle and 3 or 4 on preopercle.

D. 12 to 14, begins well behind ventrals and ends well before anal; A. 15 to 18; pectoral 8; ventral 7, little premedian. Dorsal adipose fin and rather long low one ventral.

Length 62 mm. without caudal.

(Regan and Trewavas.)

Atlantic, Caribbean Sea.

Astronesthes oculatus Regan and Trewavas

Astronesthes oculatus Regan and (Trewavas),
Danish Dana Exped. Oceanogr. Rep., No. 5,
May 30, 1929, p. 15, pl. 1, fig. 2. N. 17°45'
800 meters,
W. 64° 55.5', 1, Caribbean Sea west of St. Croix.

Depth 6½; head 5. Eye 3¾; palatine teeth weak, 4 each side; barbel ⅔ length of head, tapering, white on posterior side, black on anterior side; small elongate terminal bulb scarcely thicker than terminal portion of stem; interorbital 3¼ in head.

Postocular luminous organ very close to eye. Lateral photophores 15 between gill opening and ventral, 21 between ventral and anal. Ventral series 10 between isthmus and pectoral,

16 between pectoral and ventral, 21 between ventral and anal, 11 between anal and caudal. White spots on side of head 4 between postocular luminous organ and preopercle, 3 or 4 on preopercle.

D. 13, begins behind ventral and ends well before anal; A. 15; pectoral 8; ventral 7, little premedian. Dorsal and ventral adipose fins short. Low fold of skin in mid-ventral line before ventral adipose fin but not continuous with it.

Length 145 mm. without caudal.

(Regan and Trewavas.)

Caribbean Sea.

Astronesthes caulophorus Regan and Trewavas

Astronesthes caulophorus Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 15, fig. 3. N. 13°35' W. 30°11', 300 meters, North Atlantic.

Depth 7 1/3; depth 4. Eye 4 1/2 in head; barbel long as head, stout, white, tip not swollen but somewhat flattened, translucent, with opaque central core; each palatine with 9 to 11 teeth.

Postocular luminous organ well separated from eye. Lateral photophores 18 between gill opening and ventral, 20 between ventral and anal. Ventral series 11 between isthmus and pectoral, 18 between pectoral and ventral; 18 between ventral and anal, 12 between anal and caudal.

D. 14, inserted behind ventrals, end well before anal; A. 18; pectoral

8; ventral 7, inserted little nearer caudal base than snout end. dorsal and ventral adipose fins present.

Length 34 mm. without caudal.

(Regan and Trewavas.)

North Atlantic.

Astronesthes similus Parr

Astronesthes similus Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 32, figs. 22 and 23. N. 24° 29' W. 77° 29', 8000 feet. — Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 15, fig. 4 (N. 13° to 35° W. 47° to 84°, 25 to 3500 meters).

Depth 5 3/4 to 6 1/2; head 4 1/5 to 4 1/2. Eye 4 1/2 to 5 in head; weak palatine teeth 5 each side; barbel 1 to 1 1/3 length of head, black, ending in white bulb bearing 2 slender filaments with slightly swollen tips.

Postocular luminous organ very

Astronesthes ijimai Tanaka

Astronesthes ijimai Tanaka, Journ. College Sci. Tokyo, vol. 23, 1908, p. .

conspicuous, close behind eye. Lateral photophores 15 to 17 between pectoral and ventral, 23 to 25 between ventral and anal. Ventral series 10 or 11 between isthmus and pectoral, 15 or 16 between pectoral and ventral, 21 to 24 between between ventral and anal, 10 or 11 between anal and caudal.

D. 12 to 14, begins little behind ventral, ends far before anal; A. 19 to 21; pectoral 8; ventral 7, little premedian. Dorsal adipose fin with short base, ventral still smaller.

Length 150 mm. without caudal.

(Regan and Trewavas.)

North Atlantic, Caribbean Sea.

Astronesthes luetkeni Regan and Trewavas

Astronesthes luetkeni Regan and Trewavas, Danish dana Exped. Oceanogr. Repr., no. 5, May 30, 1929, p. 16, fig. 5 (as Lütken).

Astronesthes richardsonii (not Poey) Lütken, Kgl. danske. Videnskb. Selsk. Skrift. København, series 6, vol. 7, 1892, p. 273, pl. 3, figs. 1-2. Pacific Ocean.

Depth nearly 7; head 4⅓. Eye 7 in head; barbel 1½ length of head, ending in long flattened bulb.

Postocular luminous organ large, nearly long as eye. Lateral photophores 32. Ventral series 6 between isthmus and pectoral, 15 between pectoral and ventral, 20 between ventral and anal, 10 or 11 between anal and caudal.

D. 13, begins close behind ventrals

and ends well before anal; A. 15;
pectoral 8; ventral 7. Adipose
dorsal and very small adipose
ventral.

Length 95 mm. without caudal.

(Regan and Trewavas.)

Pacific Ocean.

Astronesthes richardsonii Poey

Astronesthes richardsonii Poey, Inem. Hist. Nat. Cuba, vol. 1, 1852, p. 176. Cuba. — Günther, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 425 (copied). — Lütken, Kon. Dansk. Videnskr. Selsk. Skrift. Köbenhavn, series 6, vol. 7, 1892, p. 273 (part; reference). — Goode and Bean, Oceanic Ichth., 1895, p. 106 (not fig. 125; part; reference). — Gilchrist and Von Bonde, Marine Biolog. Survey South Africa, Report no. 2, 1922 (1924), no. 7, p. 5 (part; reference). — Astronesthes richardsoni Jordan and Evermann, Bull. U. S. Nat. Mus., no. 47, pt. 1, 1896, p. 587 (part; reference). — Brauer,

Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee - Fische, 1906, p. 29 (part; reference). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 30 (part). — Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 17, fig. 6 (compiled).

Chauliodus richardsonii Poey, Mem. Hist. Nat. Cuba, vol. 1, 1852, pl. 10, fig. 2.

Borostomias richardsoni Barnard, Ann. South African Mus., vol. 21, pt. 1, June 1925, p. 135 (part).

Depth 6 1/3; head 4 1/8. Eye 4 3/4 in head from snout tip; barbel tapering, 3/5 length of head.

D. 12, midway between snout tip and caudal base; A. 13; pectoral 6, 1 2/3 in total head length; ventral rays 7, 1 1/4 in head, little premedian. Adipose fin moderate.

Lateral photophores 20 between ventral origin and front of anal. Ventral series 13 between pectoral and ventral origins, 12 between ventral and anal, 13 between anal origin and caudal base.

Length 150 mm. (Regan and Trewavas.)

Cuba.

Astronesthes martensii Klunzinger

Astronesthes martensii Klunzinger, Verhandel. zool. botan. Gesell. Wien, vol. 21, 1871, p. 594, Red Sea. — Lütken, Kon. Danske. Videnske. Selsk. Skrift. Köbenhavn, series 6, vol. 7, 1892, p. (273) 276, pl. 3, figs. 6 – 7. — Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., no. 5, May 30, 1929, p. 17, fig. 7 (type).

Astronesthes martensi Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee-Fische 1906, p. 32 (part). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 34 (part).

Depth 7 to 7 1/4; head 4 1/2 to 4 3/4.

Eye 4 to 4 1/3 in head; 11 or 12 palatine teeth each side; barbel 1 1/3 length of

head, slender pigmented, ending in small, white elongate bulb without appendages.

Postocular luminous organ close to eye, extended forward below eye. Lateral photophores 17 between gill opening and ventral, 20 between ventral and anal. Ventral series 10 or 11 between isthmus and pectoral, 17 or 18 between pectoral and ventral, 18 to 20 between ventral and anal, 12 or 13 between anal and caudal of which seventh, eighth and ninth at higher level.

D. 11 or 12, begins little behind ventral, ends well before anal; A. 19 to 22; pectoral 6 or 7; ventral 7, little premedian. Dorsal and ventral adipose fins short.

Length 150 mm. without caudal.
(Regan and Trewavas.)

Red Sea.

Astronesthes lucifer Gilbert

Astronesthes lucifer Gilbert, Bull. U. S. Fish Comm., vol. 23, pt. 2, 1903 (1905), p. 605, pl. 71, fig. 3. Off Kauai Island, in 368 to 1021 fathoms; off south coast Oahu, in 257 to 294 fathoms. — Weber, Siboga Exped., vol. 57, Fische, 1913, p. 13 (Timor Sea in N. Lat. 9° 10.3' E. Long. 125° 55.1' in 421 meters). — Weber and Beaufort, Fishes Indo-Austral. Archipelago, vol. 2, 1913, p. 116, fig. 42 (Timor specimen). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 32 (Hawaii). — Fowler, Mem. Bishop Mus., vol. 10, 1928, p. 34 (compiled). — Regan and Trewavas,

Danish Dana Exped. Oceanogr. Rep.,
No. 5, May 30, 1929, p. 18, fig. 8 (Japan).
Depth 6; head 4 1/5, width 3 3/4.
Snout 3 3/4 in head from snout tip;
eye 5; 1 2/5 in snout, 1 1/5 in interorbital;
maxillary extends 1 1/2 eye diameters behind
eye, expansion 2 in eye, length 1 1/4 in
head from snout tip; 5 premaxillary
canines, second pair longest and fourth
pair next in size; maxillary teeth
numerous, small, posteriorly some little
longer than others; 1 or 2 long canines
at front of mandible with 5 gradually
smaller ones on each mandibular ramus;
barbel 3 2/5 in combined head and

body to caudal base, with small terminal bulb; interorbital 3 1/4, slightly convex, depressed medially. Conspicuous photophore close below hind eye edge; 2 opercular; 18 branchiostegals, 1 for each ray; body covered with minute pores, black on silvery portion, light-on blackish areas and in more or less regular transverse series. Lateral series of photophores 21 between pectoral and ventral, 29 between ventral and anal, with 3 more over front of anal; lower or ventral series 8 from front of isthmus, then 4 to pectoral base,

19 between pectoral and ventral, 19 between ventral and anal, 18 from over front of anal to caudal base.

D. II, 10, first branched ray 1 4/5 in total head length; adipose fin 3; A. II, 18, first branched ray 2 1/8; caudal 1 4/5 ?, damaged, well forked; least depth of caudal peduncle 4 1/5; pectoral 1 4/5; ventral 1 1/3.

Grayish silvery on sides of head and body, brownish black above. Under surfaces black. Iris neutral black. Fins whitish.

Pacific Ocean.

51516 U.S.N.M.
vicinity of Kauai Island, Hawaiian
Islands. In 6324 881 fathoms.
Albatross Station 4026. Length
70? mm. Type.

6249. Medio Island, Galera Bay, Mindoro. June 9, 1908. Length 335 mm.

8049. Mompog Island. March 3, 1909. Length 283 mm.

9292. Murciélagos Bay. August 9, 1909. Length 356 mm.

8886. Iloilo Palaa Bay, Luzon. June 16, 1909. Length 290 mm.

5881. Polloc, Mindanao. May 22, 1908. Length 318 mm.

7000, 7001. Port San Pio Quinto, Camiguin Island. November 10, 1908. Length 585 & 615 mm.

~~7331 to 7337~~ 8209. Refugio Island, Pasacao, Ragay Gulf. March 9, 1909. Length 303 mm.

7334 to 7337. Tara Island. December 14, 1908. Length 268 to 432 mm.

6432, 6466, 6470. Tilig. July 14, 1908. Length 290 to 344 mm.

Astronesthes ijimai Tanaka

Astronesthes ijimai Tanaka, Journ. College Sci. Tokyo, vol. 23, art. 3, 1908, p. 9, pl. 1, fig. 1. Sagami Sea. — Parr, Bull. Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 31 (discussion).

Astronesthes iijimai Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, 1925, p. 153 (Sagami Sea; Misaki).

— Regan and Trewavas, Rep. Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 18, fig. 9 (copied).

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LOGAN SQUARE
PHILADELPHIA, PA.

Depth 6 1/8; head 4 3/5. Snout 4 in head from snout tip; eye 4 4/5; 1 1/4 in snout; maxillary extends 1 1/3 eye diameters behind eye, length 1 1/5 in head from snout tip; 4 long slender front upper canines, 2 in front below; 1 or 2 minute slender teeth each side of head of vomer; palatine teeth very small, slender, uniserial; barbel 3 in body without caudal, tip dilated; interorbital 4 in head. Gill rakers 3+11, short spinous teeth in pairs.

Suborbital luminous organ small, slightly posterior on lower eye edge. Lateral photophores 19 between pectoral and ventral, 21 behind ventral. Ventral series 8+3 between isthmus and pectoral, 19 between pectoral and ventral, 18 between ventral and anal (2 additional before ventral origin), 13 from anal origin to caudal (12+7 over anal).

D. 10 or 11, length 1 1/3 in total head length; adipose fin equals eye; A. 12 or 13, fin height 2 7/8 in total head; caudal 1 2/5; least depth of caudal peduncle 3 2/5; pectoral 1 4/5; ventral 1 1/2.

Dark brown, back and belly dark. Fins pale. Length 83 mm. without caudal. (Tanaka.)

Japan.

Astronesthes chrysophekadion (Bleeker)
Stomiamodon chrysophekadion Bleeker,
Verhandel. Batavia. Genootsch. (Bali),
vol. 22, 1849, p. 10. Boleling, Bali.
Astronesthes chrysophekadion Bleeker,
Atlas Ichth. Ind. Neerland., vol.
6, 1866 - 1872, p. 150, pl. (2) 278,
fig. 1 (type). — Weber and Beaufort,
Fishes Indo Austral. Archipelago,
vol. 2, 1913, p. 117 (copied). — Regan and
Trewavas, Danish Dana Exped. Oceanogr.
Rep., No. 5, May 30, 1929, p. 18, fig.
10 (copied).

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LOGAN SQUARE
PHILADELPHIA, PA.

Depth 6 1/4 to 6 2/5; head 4 1/2 to 4 7/8, width 2 1/2 to 2 3/5. Snout 3 1/2 to 3 4/5 in head measured from snout tip; eye 4 1/2 to 4 3/5, 1 to 1 1/4 in snout, 1 1/5 to 1 1/4 in interorbital; maxillary extends eye diameter behind eye, length 1 1/4 to 1 1/3 in head from snout tip; interorbital 3 1/4 to 3 2/3, low, with median concave depression. Gill rakers 3 + 13, as short double dentiles; gill filaments 1 1/5 in eye.

Barbel 1 4/5 to 2 in total head length, ends in very small ovoid whitish terminal bulb.

Small infero preorbital luminous

organ; small luminous organ below hind pupil edge above upper edge of maxillary; upper lateral series of photophores 17 or 18 between pectoral and ventral, 17 between ventral and anal, 3 more above front of anal; lower or ventral series 28 from isthmus to ventral of which 11 before pectoral origin, then 2 start inside before ventral origin, $\frac{17}{\wedge}$ continuing to anal origin and 14 to caudal base with last above anal base elevated.

D. III, 8 or III, 9, first branched ray 1 1/3 to 1 2/5 in total head length;

A. III, 14 or III, 15, first branched ray 2 1/8 to 2 1/5; caudal 1 2/5 to 1 3/4, forked; least depth of caudal peduncle 3 4/5 to 4 1/8; adipose fin 3 1/4 to 3 2/5; pectoral 1 3/5 to 1 4/5; ventral 1 2/5 to 1 1/2.

Back brown, also upper surface of head. Sides of head and body leaden or pale grayish silvery, which on under surface of body with numerous close set dusky to blackish dots. Iris silvery gray. Fins all whitish, likewise barbel.

Western Pacific. Though the present species is imperfectly known

only from Bleeker's account and crude figure. I feel that the materials listed below pertain to it. The chief character is the short barbel, much shorter than the head in my materials. The photophores agree largely with those in Lütken's figure of Eustrenesthes martensi Klunzinger from the Red Sea, though in that species the barbel is shown as 1 2/7 times head.

D. 5363. Cape Santiago Light, S. 79° W., 4.5 miles (N. 13° 47' 20" E. 120° 43' 30"), Balayan Bay, Luzon. In 180 fathoms. February 20, 1909. Length 47 mm.

D. 5563. Dammi Island (N.), N. 79° W., 6.1 miles (N. 5° 48' 12" E. 120° 30' 48"), between Jolo and Tawi Tawi. In 224 fathoms. September 21, 1909. Length 43 to 105 mm. 8 examples.

31 to 65 mm. 6 examples.

2235. D. 5566. Dammi Island (N.), S. 67° W., 6.8 miles (N. 5° 52 1/2" E. 120° 31"), between Jolo and Tawi Tawi. In 244 fathoms. September 21, 1909. Length 155 mm.

D. 5567. Dammi Island (N.), N. 81° W., 9 miles (N. 5° 48' E. 120° 33' 45"), north of Tawi Tawi. In 268 fathoms. September 21, 1909. Length 62 mm.

D. 5363. Cape Santiago Light, S. 79° W., 4.5 miles (N. 13° 47' 20" E. 120° 43' 30"), Balayan Bay, Luzon. In 180 fathoms. February 20, 1909. Length 47 mm.

D. 5564. Lammi Island (N.), S. 85° W., 6.1 miles (N. 5° 50' E. 120° 31'), between Jolo and Tawi Tawi. In 236 fathoms. September 21, 1909. Length 31 to 65 mm. 6 examples.

2235. D. 5566. Lammi Island (N.), S. 67° W., 6.8 miles (N. 5° 52 1/2" E. 120° 31"), between Jolo and Tawi Tawi. In 244 fathoms. September 21, 1909. Length 155 mm.

D. 5567. Lammi Island (N.), N. 81° W., 9 miles (N. 5° 48' E. 120° 33' 45"), north of Tawi Tawi. In 268 fathoms. September 21, 1909. Length 62 mm.

below, 37 to 57 predorsal forward to first third in snout, 18 to 24, in vertical series on cheek. Suprascapula entire. Scale with 4 to 6 basal radiating striae; apical denticles 63 to 66, small points, each with 11 to 15 transverse series of basal elements; circuli fine.

D. XIII, 18, I to 20, I; fourth spine 2 1/8 to 2 7/8 in head, first ray 2 1/5 to 3 3/4; A. III, 6, I or 7, I, third spine 1 3/4 to 3 2/5, second ray 1 3/4 to 2 1/8; caudal 1 to 1 1/3, slightly emarginate behind, truncate expanded; least depth of caudal peduncle 2 1/2 to 2 4/5; pectoral 1 2/5 to 1 2/3; ventral 1 1/3 to 1 2/3.

Back and above dull olive gray generally, little paler below. 7 to 8 longitudinal or horizontal slightly paler bands, about 10 or more with age, each much narrower than broad

2214. D. 5549. Jolo Light (Jolo), N. 80° E., 15.8 miles (N. 6° 1' 15" E. 120° 44' 20"), Jolo Island and vicinity. In 263 fathoms. September 17, 1909. Length 64 to 128 mm. 2 examples.

D. 5551. Jolo Light (E.), N. 60° E., 18 miles (N. 5° 54' 48" E. 120° 44' 24"), Jolo Island and vicinity. In 193 fathoms. September 17, 1909. Length 56 mm.

3587. D. 5621. Malayan Island (S.), N. 54° W., 3 miles (N. 0° 15' E. 127° 24' 35"), between Gillolo and Malayan Island. In 298 fathoms. November 28, 1909. Length 112 mm.

10049. D. 5269. Matocot Point, S., 54° E., 3 miles (N. 13° 39' 50" E. 120° 59' 30"), Verde Island Passage and Batangas Bay. In 220 fathoms. June 8, 1908. Length 88 mm.

milar to adult except spots on back and side
st fused into stripes; interspaces on side of
tely blue; dorsal spinous incized (parrim)
with hyaline orange; (L. arty) row of spots in base and
another thru center of ~~three~~ membranes continu-
bars across soft dorsal; marginal bar of spinous
continuous with another bar thru soft dorsal;
without spots, olive yellow; paired

10086. D. 5289. Inatocot Point, S. 42° E., 5 miles (N. 13° 41' 50" E. 120° 58' 30"), China Sea vicinity southern Luzon. In 172 fathoms. July 22, 1908. Length 138 mm.

5747 and 5748. D. 5171. Omapui Island (W.), S. 22° W., 12 miles (N. 5° 5' E. 119° 28'), Sulu Archipelago vicinity Sibutu Island. In 250 fathoms. February 28, 1908. Length 112 to 136 mm.

D. 5574. Sinalue Island (N.), S. 66° E., 5.8 miles (N. 5° 30' 45" E. 120° 7' 57"), north of Tawi Tawi. In 340 fathoms. September 23, 1909. Length 49 mm.

4291. D. 5662. Jana Keke Island (W.), N. 17° W., 12.5 miles (S. 5° 43' E. 119° 18"), Flores Sea. In 211 fathoms. December 21, 1909. Length 113 mm.

depth 2 2/5 to 2 4/5; head 3 to 3 1/4, width 2 to 2 1/3. Snout 2 2/5 to 3 1/8 in head; eye 3 1/4 to 4 2/3, 1 to 2 in snout, greater than interorbital in young to 1 to 1 1/3 in interorbital with age; maxillary nearly or quite reaches opposite front eye edge, expansion 1 3/5 to 3 in eye, length 2 3/4 to 3 1/4 in head; lips moderately thick, fleshy; teeth fine, conic, in 5 to 7 irregular series with outermost little enlarged; interorbital 3 1/4 to 5, broadly convex; livid preopercle edge denticulated. Gill rakers 11 or 12 + 19 or 20, lanceolate, 2 to 2 1/4 in gill filaments, which 1 to 1 2/5 1 1/4 in eye.

Scales 77 to 88 in lateral line to caudal base and 10 to 18 more on latter; tubular scales 53 to 58 in lateral line to caudal base and 7 to 10 more on latter; 12 to 16 scales above lateral line, 16 to 22

D. 5368. Tayabas Light (outer), N. 32° W., 21.8 miles (N. 13° 35' 30" E. 121° 48'), Marinduque Island and vicinity. In 181 fathoms. February 23, 1909. Length 55 mm.

9045, 9046. Jacloban market. July 25, 1909. Length 218 to 242 mm.

9112, 9113 [D. 5478]. Jacbue, Leyte. July 29, 1909. Length 215 to 287 mm.

5112. Vandaban market, Borneo. March 4, 1908. Length 255 mm.

56052 U. S. N. M. Bulan. Bureau of Fisheries (4006). Length 44 mm.

56322 U. S. N. M. Manila. Dr. G. A. Lung. Length 185 mm. As Lutjanus dodecanthus.

76620 U. S. N. M. Takao, Formosa. Dr. F. Baker. Length 260 mm.

Astronesthes gemmifer Goode and Bean

Astronesthes gemmifer Goode and Bean, Oceanic Ichth., 1895, p. 105, pl. 33, fig. 124. N. 44°25' W. 53°12', from halibut taken in 300 fathoms. — Jordan and Evermann, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 586 (copied); pt. 4, 1900, pl. 93, fig. 251 (copied). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 30, fig. 21 b (maxillary) (type). — Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 19, pl. 1, fig. 3 (N. 13°47' W. 61°26', 3500 meters; N. 34° W. 70°1', 150 meters; N. 12°59' W. 32°49', 300 meters; off Sierra Leone).

Depth 5; head 4 2/3, width 2 3/4.
Snout 3 1/2 in head from snout tip;
eye 3 1/2, equals snout or interorbital;
maxillary extends 1 1/5 eye diameters
behind eye, expansion 2 3/4 in eye,
length but slightly less than head
from snout tip; each premaxillary
with 4 large canines; maxillary teeth
very fine, uniform, numerous;
mandible with anterior pair of long
canines, then 6 or 7 graduated shorter
on each ramus; barbel equals head,
simple; interorbital 3 1/2, low, depressed
medially. Gill rakers 2 + 10, mostly as
short, double or rarely triple denticles,

1 3/4 in gill filaments, which 1 1/2 in eye.

Small postorbital photophore below eye. Upper lateral photophores 16 between pectoral and ventral, 20 between ventral and anal, 19? from opposite anal origin and caudal base; lower or ventral series 13 on isthmus to pectoral, 28 between pectoral and ventral, 18 between ventral and anal, 20? from opposite anal origin to caudal base; branchiostegals 19.

D. II, 15, first branched ray 1 2/5? in total head length; adipose fin 6 1/5?; A. II, 15, first branched ray

2 1/3; caudal 2?, damaged, well forked; least depth of caudal peduncle 3 1/5; pectoral 1 2/5; ventral 1 2/5.

Color gone as most of skin lost, now mostly pale uniform brownish. Iris neutral slate. Fins pale brownish.

Atlantic Ocean.

24645 U.S.N.M. N. 44° 25' W. 53° 12'.

From halibut taken in about 500 fathoms. January 26, 1890. Schooner "Polar Wave". Length 180? mm. Type. In poor preservation.

behind and well separated from eye.

Lateral photophores 16 to 18 between pectoral and ventral, 18 or 19 between ventral and anal. Ventral series 9 or 10 between isthmus and pectoral, 17 to 19 between pectoral and ventral, 17 or 18 between ventral and anal, 11 or 12 between anal and caudal.

D. 15 or 16, begins above ventral base and end above or immediately before first anal ray; A. 12 to 15; pectoral 8 or 9; ventral 7, nearer caudal base than snout tip. Small dorsal and ventral adipose fins.

Length 28 mm. without caudal.

(Regan and Trewavas.)

North Atlantic.

Astronesthes cyclophotus Regan and Trewavas

Astronesthes cyclophotus Regan and Trewavas,
Danish Dana Exped. Oceanogr. Rep., No. 5,
May 30, 1929, p. 19, fig. 11. N. 30°55' W. 58°48',
80 meters; N. 29°24' W. 48°8', 110 meters; N. 28°48'
W. 20°45', 300 meters; N. 26°15' W. 20°53', 200
meters; N. 32°55' W. 21°51', 500 meters.

Depth 4 to 5; head 3 1/8 to 3 1/2. Eye
5 to 5 1/2 in head, 1 1/2 in snout; palatine
teeth 4 to 6 each side; barbel 2/3 long
as head, black, with white terminal
part flattened into delicate, narrow,
leaf-like structure, tapering to point
and with opaque axis.

Postocular luminous organ circular,

Astronesthes neopogon Regan and Trewavas

Astronesthes neopogon Regan and Trewavas,

Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 20, pl. 11, fig. 1. N. 34°40' W. 33°16'; 1000 meters, North Atlantic.

Depth 7; head 4½. Eye 5 in head; palatine teeth rather strong, 8 each side; barbel ⅖ length of head, thick, laterally compressed, white, without any slender basal part.

Postocular luminous organ very small, well separated from eye. Lateral photophores 17 between pectoral and ventral, 19 between ventral and anal. Ventral series 10 between isthmus and pectoral, 18 or 19 between pectoral and ventral, 17 or 18 between ventral and anal, 11 between anal and caudal. Small luminous dots all over body and larger spots, some forming irregular series from pectoral to ventrals, others lateral band backwards from opercle and others

scattered on back.

D. 17, begins little behind ventral and ending not far from front of anal; A. 15; pectoral 9, 3/4 of head; ventral 7, median. Adipose dorsal and small adipose ventral.

Length 125 mm. without caudal.

(Regan and Trewavas.)

North Atlantic.

Astronesthes niger Richardson

Astronesthes nigra Richardson, Zool. Voy. Sulphur, Fish, 1844, p. 97, pl. 50, figs. 1–3. Locality unknown, supposed to be the China Seas.

Astronesthes niger Günther, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 425 (Gulf of Guinea, Lagos, Atlantic, Gulf of Mexico, type); Rep. Voy. Challenger, vol. 31, pt. 2, 1889, p. 38 (Indian Ocean; Atlantic). — Lütken, Kon. Dansk. Vidensk. Selsk. Skrift. Köbenhavn, series 6, vol. 7, 1892, p. 273, pl. 3, figs. 3–5 (west coast of South America). —

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Mus., 1899, p. 211 (off Travancore coast, in 224 to 284 fathoms). — Parr, Bull.

Astronesthes niger Richardson

Astronesthes nigra Richardson, Zool. Voy. Sulphur, Fish., 1844, p. 97, pl. 50, figs. 1–3. Locality unknown, supposed to be the China Seas.

Astronesthes niger Günther, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 425 (Gulf of Guinea, Lagos, Atlantic, Gulf of Mexico, type); Rep. Voy. Challenger, vol. 31, pt. 2, 1889, p. 38 (Indian Ocean; Atlantic).— Goode and Bean, Oceanic Ichth., 1895, pp. 105, 515 (type of Chauliodus fieldii).— ? Alcock, Cat. Deep Sea Fishes Indian Mus., 1899, p. 211 (off Travancore coast, in 224 to 284 fathoms).— Parr, Bull.

Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 36 ("so far only recorded from the Atlantic Ocean").—

↑ Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., no. 5, May 30, 1929, p. 20, fig. 12 (type) (N. 12° to 37° W. 14° to 79°, 0 to 3000 meters).

Stomias fieldii Valenciennes, Hist. Nat. Poiss., vol. 18, 1846, p. 378. Between Mogador and New York.

(Esox circhatus (Field) Valenciennes, Hist. Nat. Poiss., vol. 18, 1846, p. 378 (name in text).

Chauliodus fieldii Valenciennes, Hist. Nat. Poiss., vol. 22, 1849, p. 389. One hundred and fifty leagues south east of Azores and near Saint Helena.

Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 36 ("so far only recorded from the Atlantic Ocean").—

?Stomias leucopterus Eydoux and Souleyet, Voy. Bonite, Zool., vol. 1, 1841, p. 193, pl. 7, fig. 4. Atlantic Ocean.

Stomias fieldii Valenciennes, Hist. Nat. Poiss., vol. 18, 1846, p. 378. Between Mogador and New York.

(Esox cirrhatus (Field) Valenciennes, Hist. Nat. Poiss., vol. 18, 1846, p. 378 (name in text).

Chauliodus fieldii Valenciennes, Hist. Nat. Poiss., vol. 22, 1849, p. 389. One hundred and fifty leagues south east of Azores and near Saint Helena.

Phaenodon ringens Lowe, Proc. Zool. Soc. London, 1850, p. 251. Madeira.

Astronesthes barbatus Kner, Sitz. Ber. Akad. Wiss. Wien, Math.-naturw. Klasse, vol. 39, 1860, p. 543, pl., fig. 5. Atlantic Ocean near the Brazilian coast. — Günther, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 425 (copied).

Astronesthes myriaster Zugmayer, Bull. Inst. Océanogr. Monaco, No. 253, 1913, p. 4. — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 35 (copied).

Depth 4 to 4 1/4; head 3 2/5 to 3 3/5, width 2 to 2 3/5. Snout 3 1/2 - 4 in head from snout tip; eye 4 1/2 to 4 4/5, 1 1/5 to 1 1/4 in snout, 1 1/2 to 1 2/3 in interorbital; maxillary extends 1 1/2 to 1 2/3 eye diameters behind eye, expansion 1 1/3 to 1 2/3 in eye, length 1 1/5 in head from snout tip; premaxillary with 6 canines, second pair longest; maxillary teeth 12, graduated longer to last which about long as smaller premaxillary teeth; 6 or 7 canines on each mandibular ramus, second pair longest; barbel 4 in combined head and body to caudal base, terminal bulb moderately large;

interorbital 2 3/4 to 2 7/8 low, depressed medially. Gill rakers 3 + 11, clusters of 2 or 3 minute spinules, much less than gill filaments which equal eye.

Small anterior photophore below front eye edge and larger below hind eye edge; 1 opercular; Lateral series of photophores 13 between pectoral and ventral, 19 to 20 between ventral and anal, 12 or 13 from front of anal to caudal; lower, ventral series 10 on isthmus before pectoral, then 12 between pectoral and ventral, 16 or 17 between ventral and anal, then 2 or

3 over front of anal base. Whole lower lateral and under portion of body studded with close set minute photophores.

D. II, 13 or II, 14, second branched ray 1 1/2 to 1 3/5 in total head length; A. II, 9 or II, 10, second branched ray 2 to 2 1/8; caudal 1 4/5, well forked; least depth of caudal peduncle 4 to 4 1/5; pectoral 1 1/4; ventral 1 to 1 2/5.

Uniform brownish. Iris neutral gray. Fins paler to whitish, also barbel.

Atlantic and Indian Oceans.

34538 U.S.N.M. On voyage from Mogador to New York. May 1819. Captain Field. Length 44 mm.

44592 U.S.N.M. N. 38° ~~30°~~ 24' W. 71° 52'. Surface. Albatross Station. Length 28 or 29 mm. 2 examples.

85456 U.S.N.M. N. 36° 45' W. 74° 28' 30". Albatross Station. Length 33 to 38 mm. 2 examples.

grayish basal spots. Soft dorsal dusky, with uniform small grayish spots. Anal like soft dorsal. Caudal dusky, marked with gray spots. Paired fins brownish, dusky terminally. Small examples with paler longitudinal band, ill defined, reflected on caudal medially.

Diagnosis. Known chiefly by its coloration, which generally dark brown, most every scale with pale spot, often forming vermiculations.

Type. — Cat. No. 89996, U.S.N.M.

8146. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length 303 mm.

8084. Alimango Bay. March 5, 1909. Length 369 mm.

6507, 6508. Balibian Bay. July 17, 1908. Length 274 to 289 mm.

Astronesthes boulengeri Gilchrist

Astronesthes boulengeri Gilchrist, Marine Invest. South Africa, vol. 2, 1902, p. 103, pl. 6. Cape Point Light House bearing N. 83° E. distant 35½ miles, in 360 fathoms; East Coast, Buffalo River North West by West distant 21 miles, in 490 fathoms. — Barnard, Ann. South African Mus., vol. 21, pt. 1, June 1925, p. 133, pl. 7, fig. 4 (types). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 37 (note). — Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 21, fig. 13 (copied).

The Academy of Natural Sciences
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LOGAN SQUARE
PHILADELPHIA, PA.

Depth 6; head 4½. Eye 4½ in head; barbel ½ length of head (probably broken).

Postocular luminous organ very small, below eye. Lateral photophores 35 between anal and caudal. Ventral series 7 between isthmus and pectoral, 14 between pectoral and ventral, 35 from ventral to caudal. Minute luminous spots scattered over head and body and forming 2 rows on ventral surface. Glandular patches pinkish when fresh, white in spirit, on sides of body behind ventral region and above and below on caudal peduncle.

D. 16, inserted little behind ventrals and ending immediately before anal; A. 15; pectoral rays 8; ventral 7, inserted little nearer snout tip than caud. Small dorsal and ventral adipose fins.

Length 213 mm. (Regan and Trewavas)

South Africa.

Astronesthes cyaneus (Brauer)

Bathylychnus cyaneus Brauer, Zool. Anzeiger, vol. 26, No. 668, 1902, p. 289. South of Ceylon, 2000 meters; Deutsch. Tiefsee Exped. Valdivia, vol. 5, Tiefsee-Fische, 1906, p. 35, text figs. 6 a-b, pl. 2, fig. 5 (type, from between Ceylon and Maldives in N. Lat. 4°56' E. Long. 78°15'3"). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 37 (compiled).

Astronesthes cyaneus Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 21, fig. 14 (N. 9° to 26° W. 20° to 83°, 19 to 3500 meters). — Norman, Discovery Rep., vol. 2, 1930, p. 306 (N. 6°55' W. 15°54').

Depth 5 to 6 1/4; head 3 3/4 to 4. Eye 4 to 4 2/3 in head, about equals snout; each palatine with 4 to 6 weak teeth; barbel slender, white, 1/2 head, with age when complete ending in very small elongate bulb.

Postocular luminous organ small, close to eye. Lateral photophores 13 or 14 between gill opening and ventral, 18 to 21 between ventral and anal. Ventral series 9 or 10 between isthmus and pectoral, 12 to 15 between pectoral and ventral, 17 to 19 between ventral and anal, 9 to 12 between anal and caudal.

D. 18 to 21, begins just behind ventral and ends above third to ninth anal ray; A. 14 or 15; pectoral 8, rarely 7; ventral 7, nearer snout tip than caudal base. Small

adipose dorsal and ventral fins.

White or yellowish patches of glandular tissue sometimes present on head and especially lower part of opercle. Sides of head and body with metallic, steely or bronze like luster, often showing blue irridescence. Length 76 mm. without caudal. (Regan and Trewavas.)

Atlantic and Indian Oceans.

Astronesthes leucopogon Regan and Trewavas

Astronesthes leucopogon Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 22, pl. 2, fig. 2. N. 30°50' W. 44°30'; N. 33°26' W. 16°59'; 300 meters.

Depth 5 1/4 to 5 1/2; head 4 to 4 2/5. Eye 4 to 5 in head, equals or little greater than snout; palatine teeth 5 or 6 each side; barbel 1 1/8 to 1 1/4 length of head, white, tapering somewhat to blunt end.

Postocular luminous organ close to eye, extended forward. Lateral photophores 10 to 12 between gill opening and ventral, 18 or 19 between ventral and anal. Ventral series 9 or 10 between isthmus and pectoral, 10 or 11 between pectoral and ventral, 14 or 15 between ventral

and anal, 11 or 12 between anal and caudal. Smaller photophores conspicuous, especially in 2 rows along ventral surface. Glandular white patches, probably luminous, on head between eye and premaxillary and sides behind ventral, above ventral adipose fin and before ventral above pectoral.

D. 17 or 18, begins above or just behind ventral base and ends above second to fourth anal ray; A. 17; pectoral 8; ventral 7 or 8, little premedian. Small ventral adipose fin and short adipose dorsal.

Length 40 mm. without caudal.
(Regan and Trewavas.)

North Atlantic.

Astronesthes longiceps Regan and Trewavas

Astronesthes longiceps Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 23, fig. 15. N. 29°24' W. 48°8', 10 meters.

Depth 4 2/3; head 3 1/2. Eye 5 1/2 in head; 7 palatine teeth each side; barbel little longer than head.

Postocular luminous organ small, close behind eye below. Lateral photophores 13 between gill opening and ventral, 21 between ventral and anal. Ventral series 9 between isthmus and pectoral, 10 between pectoral and ventral, 13 between ventral and anal.

D. 18; A. 13; pectoral 8; ventral 7. Small adipose dorsal and smaller ventral.

Length 25 mm. without caudal.

(Regan and Trewavas.)

Atlantic.

Astronesthes indicus Brauer

Astronesthes indicus Brauer, Zool. Anzeiger, vol. 25, No. 668, 1902, p. 287. East of Zanzibar, in 3000 meters; Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee-Fische, 1906, p. 53, text figs. 5a-b, pl. 2, fig. 3 (type, from Indian Ocean between Zanzibar and Seychelles in S. Lat. 5° 12' 5" E. Long. 46° 32' 3", in 3000 meters). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 36 (compiled). — Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 23, pl. 2, fig. 3 (N. 8° to 28° W. 20° to 66°, 50 to 6000 meters). — Norman, Discovery Rep., vol. 2, 1930, p. 306 (S. 00° 56' W. 14° 8' 30").

THE ACADEMY OF NATURAL SCIENCES
OF PHILADELPHIA

? Lithocarthus F-G.
Ida 3-2 7-27-7, 1900, H.
35 F-3

JAMES A. G. REHN
SECRETARY

LOGAN SQUARE
PHILADELPHIA, PA.

Depth 4 1/2 to 5 1/2; head 3 1/2 to 4 1/4.

Eye 4 to 5 in head; rather strong palatine teeth directed backwards, rather close series of 8 to 12 each side; barbel 1/2 to 1 1/2 length of head, white or very lightly pigmented, almost uniformly thick for basal 3/4, then somewhat thicker and slightly laterally compressed, near end strongly flattened in other direction and terminal part translucent with opaque axis; with age barbel 1/2 head, pigmented, tapering almost to tip, ending in minute white bulb with pigmented strip on each side meeting over tip.

Postocular luminous organ elongated, extends forward below pupil. Lateral photophores 5 between gill opening and ventral, 6 to 8 between ventral and anal. Ventral series 5 between

isthmus and pectoral, 5 or 6 between pectoral and ventral, 8 or 9 between ventral and anal, 7 to 9 between anal and caudal. Large white patches of luminous tissue present on sides of body with age, in definite positions near dorsal and ventral ends of opercle, behind and little above pectoral base, 1 before ventral, and 2 (lateral and dorsal) above.

D. 15 or 16, begins over or little behind ventral base and ends above first to seventh anal ray; D. 14 to 16, usually 14; pectoral 7 or 8; ventral 7, median.

Length 103 mm. without caudal.

(Regan and Trewavas.)

Atlantic and Indian Oceans.

Genus Boroxtomias Regan

Boroxtomias Regan, Trans. Linn. Soc. London, series 2, vol. 12, Zool., 1908, p. 217. Type Boroxtomias braueri Regan, designated by Jordan, Genera of Fishes, pt. 4, 1920, p. 529.

Mouth cleft straight. Premaxillaries and lower jaw with strong fangs. Maxillary teeth few (7 to 10), set well apart, rather strong, erect, incurved, some or all straight and slightly barbed at end, like fangs of premaxillaries and lower jaw. Generally pair of teeth on vomer. Series of teeth on each palatine. Short strong teeth on gill arches, none on ceratohyal. Postocular luminous organ single. Dorsal rays 11 to 16, begins above or just behind ventrals, not extending above anal. Anal rays 10 to 18.

Atlantic and Indian Oceans, Gulf of Panama.

Astronesthes richardsonii Poey

Astronesthes richardsonii Poey, Mem. Hist. Nat. Cuba, vol. 1, 1852, p. 176. Cuba.— Günther, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 425 (copied).— Lütken, Kon. Danske. Videnske. Selsk. Skrift. København, series 6, vol. 7, 1892, p. 273, ~~pl. 3, figs. 1-2~~ (part; reference), ~~(Pacific Ocean)~~.— Goode and Bean, Ocean. Ichth., 1895, p. 106 (not fig. 125). (compiled).— Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee-Fische, 1906, p. 29 (Gulf of Guinea, in 2000 meters). — Gilchrist and Von Bonde, Fisher. Marine Biolog. Surv. South Africa, Report No. 3, 1922 (1924), No. 7, p. 5 (off Table Bay, in

Analysis of species

a.' dorsal 11; Anal 10; vent median between ventrals and anal. abyssorum.

a.² dorsal 11; Anal 14; vent near anal fin.
b.' Eye 4 in head. macrophthalmus.
b.² Eye 5 2/3 in head. antarcticus.

a.³ dorsal 13 or 14; Anal 14 to 16.
c.' Barbel little shorter than head; postocular luminous organ long as eye. schmidti.
c.² Barbel 1 1/3 to 1 1/2 times head, slender, slightly thickened white terminal part 1/20 of head; postocular luminous organ shorter than eye, which 8 in head. braueri.
c.³ Barbel 1 1/2 times head; eye 6 2/5 in head. elucens.

a.⁴ dorsal 14; Anal 18; barbel 1 2/5 times head, ending in slightly thickened white part 1/10 of head, with filament. lanamensis.

a.^{5} dorsal 16; anal 17; barbel 1 1/2 times head, ending in small white bulb with 2 filaments. macrostuis.

Borostomias abyssorum (Koehler)
Astronesthes abyssorum Koehler, Ann.
Univ. Lyon.: Paris, fasc. 26, 1896, p. 511,
pl. 27, fig. 10.

— Parr, Bull. Bingham Oceanogr. Collection,
vol. 3, art. 2, Dec. 30, 1927, p. 30 (copied).

Borostomias abyssorum Regan and
Trewavas, Danish Dana Expedition Oceanogr. Rep.,
No. 5, May 30, 1929, p. 24, fig. 16 (compiled).

Depth 7½; head 4⅓. Snout 4 in head;
eye 4½; maxillary with about 6 large
teeth; barbel little less than ¾ of head,
with well marked swelling little before
tip, its terminal part unpigmented.

Postocular luminous organ large.
Photophores not determined.

D. 11, begins above ventral base; A. 10;
pectoral 5, short; ventral 7, less than pectoral,

little postmedian. Vent equidistant from ventral and anal. Length 75 mm. without caudal. (Regan and Trewavas.)

Off Atlantic coast of France.

Boreostomias macrophthalmus Regan and Trewavas

Boreostomias macrophthalmus Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 25, fig. 17 (compiled).

Astronesthes richardsonii (not Poey) Goode and Bean, Oceanic Ichth., 1895, p. 106, pl. 33, fig. 125. N. 39°38' W. 71°39'45", 515 fathoms.

Astronesthes richardsoni Jordan and Evermann, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 587 (part); pt. 4, 1900, pl. 94, fig. 262 (copied). — Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee-Fische, 1906, p.

29 (part). — Barnard, Ann. South African Mus., vol. 21, June 1925, p. 135 (part).

Astronesthes elucens (not Brauer) Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 28, fig. 20 (type), fig. 21a (maxillary).

Depth 6 3/4; head 5, width 3. Snout 5 1/2 in head from snout tip; eye 4 1/2, little greater than snout, equals interorbital; maxillary extends 2 eye diameters behind eye, length 1 1/8 in head from snout tip; 6 large premaxillary canines, second or third pair longest; 9 or 10 smaller maxillary

Astronesthes martensii Klunzinger

Astronesthes martensii Klunzinger, Verhand. zool. botan. Gesell. Wien, vol. 21, 1871, p. 594. Red Sea. — Lütken, Kon. Dansk. Vidensk. Selsk. Skrift. København, series 6, vol. 7, 1892, p. (273) 276, text fig., pl. 3, figs. 6–7 (off Cape Verde Islands). — Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee-Fische, (part) 1906, p. 32, ~~pl. 2, fig. 4 (type of Astronesthes splendidus from N. Lat. 4°56' E. Long. 78d 15-1 3"~~ N. 17° W. 22°). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 34 (N. 24° W. 75° & 77°, 6000 to 8000 feet).

Astronesthes splendidus Brauer, Zool. Anzeiger, vol. 25, No. 668, 1902, p. 288. South of Ceylon, in 2000 meters.

teeth; pair of large anterior lower canines with others all graduated smaller posteriorly; barbel 1 2/3 in head from snout tip, simple, tapering; interorbital 4, slightly depressed. Gill rakers 3 + 13, short denticles, 1 1/2 in gill filaments, which 2 1/2 in eye.

Postorbital luminous body half pupil, close above maxillary below and behind eye. Upper lateral series of photophores 15 between pectoral and ventral, 12 between ventral and anal; lower or ventral series 13? on isthmus, 15 between pectoral and ventral, 12 between ventral and vent, 15 from

opposite anal origin to caudal.

D. II, 9, first branched ray 1 7/8.? in total head length; adipose fin 3 2/5; A. II, 12, first branched ray 2 1/3.?; caudal 1 3/4.?, damaged, well forked; pectoral 1 2/3.?; ventral 2 1/8.?; least depth of caudal peduncle 1 1/4 in eye.

Body mostly blackish, where thin torn away pale brown. Iris neutral gray. Fins pale dusky to gray.

Atlantic Ocean.

35540 U.S.N.M. N. 39° 38' 00" W. 71° 39' 45", off Cuba. Albatross Station 2202. Length 184? mm. As Astronesthes richardsoni.

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Borostomias antarcticus (Lönnberg)

Astronesthes antarcticus Lönnberg, Zool. Anzeiger, vol. 28, 1905, p. 762. S. 48°27' W. 42°36', 2500 meters. — Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee-Fische, 1906, p. 29 (diagnosis in key). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 30 (compiled).

Astronectes antarcticus Lönnberg, Wiss. Ergeb. Schwed. Südpolar Exped., vol. 5, pt. 6, Fische, 1905, p. 65 (type).

Borostomias antarcticus Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., no. 5, May 30, 1929, p. 25 (compiled). — Norman, Discovery Rep., vol. 2, 1930, p. 306, fig. 15 (S. 52°55' E. 9°50', 650 to 700 meters).

Depth 5 2/3; head 5. Snout 3 2/3 in head; eye 5 2/3; barbel little longer than head, with unpigmented somewhat club shaped luminous organ at end; maxillary with 7 teeth.

Postocular luminous organ less than eye. Lateral photophores 56. Ventral series 35 between isthmus and ventral, 19? between ventral and anal.

D. 11, begins over ventral; A. 15; pectoral 9; ventral 7, postmedian. Length 188 mm. without caudal.

(Regan and Trewavas.)

South Atlantic.

depth 5 2/3; head 5. Eye 5 3/3 in
head, mout 3 2/3.

Borostomias schmidti Regan and Trewavas
Borostomias schmidti Regan and Trewavas,
Danish Dana Exped. Oceanogr. Rep., No. 5,
May 30, 1929, p. 26, pl. 3, fig. 1. N. 17°
55' W. 24° 35', 3000 meters.

Depth 5; head 4 3/4. Eye 6 1/2 in head;
maxillary with 8 to 10 teeth; barbel
little shorter than head, with rather
long, white, terminal portion, not
enlarged, separated from black stem
by transparent region with narrow,
dark stalk in middle.

Postocular luminous organ equals eye.
Lateral ~~series~~ photophores 21 between gill
opening and ventral, 15 between ventral
and fand anal. Ventral series 10 between
isthmus and pectoral, 22 between pectoral
and ventral, 15 between ventral and anal,
5 + 8 between anal and caudal.

D. 13, begins just behind ventral; A. 16;
pectoral 7; ventral 7, postmedian. Length
185 mm. without caudal. (Regan and Trewavas.)
North Atlantic.

Astromesthes myriaster Zugmayer

Astromesthes myriaster Zugmayer, Bull.
Inst. Océanogr. Monaco, No. , 1913,

Boroxtomias braueri Regan

Boroxtomias braueri Regan, Trans. Linn. Soc. London, series 2, vol. 12, Zool., 1908, p. 217, pl. 23, fig. 1. Near Desroches Atoll, Indian Ocean, 0 to 750 fathoms. — Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 26, pl. 3, fig. 2 (N. 12° 11' W. 35° 49', 2000 to 5000 meters; N. 18° 50' W. 79° 7', 3000 meters, west of Jamaica; type).

Depth 5 to 5 1/2; head 4 to 4 1/2. Eye 8 in head; less than snout; 8 to 10 maxillary teeth; lower jaw 9/10 of head; barbel 1 1/3 to 1 1/2 length of head, slender, with slightly thickened terminal white portion about 1/20 length of head.

Postocular luminous organ 1 1/2 eye. Lateral photophores 22 between gill opening

and ventral, 15 or 16 between ventral and anal. Ventral series 10 to 12 between isthmus and pectoral, 22 to 24 between pectoral and ventral, 15 to 16 between ventral and anal, 13 (5+8) between anal and caudal.

D. 13 to 14, begins above or just behind ventral and ending well before anal; A. 14 to 16; pectoral 7; ventral 7, nearer caudal base than snout end. Length 175 mm. without caudal.

(Regan and Trewavas.)

Atlantic and Indian Oceans.

Borostomias elucens (Brauer)

Astronesthes elucens Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 15, Tiefsee-Fische, 1906, p. 31. Gulf of Guinea in N. Lat. 0°55'7" W. Long. 4° 37'6", in 2500 meters. — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 28 (part).

Borostomias elucens Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 26 (compiled).

Apparently distinguished from Borostomias braueri by the larger eye, longer than snout and 6 2/5 length of head. Barbel 1 1/2 head.

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LOGAN SQUARE
PHILADELPHIA, PA.

Ventral photophores 10 between isthmus and pectoral, 23 between pectoral and ventral, 14 between ventral and anal, 14 between anal and caudal.

D. 14; A. 16; pectoral 7; ventral 7. Length 146 mm. without caudal.

(Regan and Trewavas.)

Gulf of Guinea.

Borostomias panamensis Regan and Trewavas

Borostomias panamensis Regan and Trewavas,

Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 26, pl. 4, fig. 1. N. 6°48' W. 80°33', 3600 meters, Gulf of Panama.

Depth 6; head 5. Eye 8 in head; lower jaw 6/7 of head; maxillary teeth 9; barbel 1 2/5 length of head, with filament near end.

Postocular luminous organ half of eye. Lateral photophores 22 between gill opening and ventral, 17 between ventral and anal. Ventral series 11 between isthmus and pectoral, 23 between pectoral and ventral, 17 between ventral and anal, 12 (5+7) between anal and caudal.

D. 14, begins just behind ventral, ends well before anal; A. 18; pectoral 7; ventral 7, postmedian. Length 208 mm. without caudal.

(Regan Trewavas.)

Gulf of Panama.

Borostomias macristius Regan and Trewavas

Borostomias macristius Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 27, pl. 4, fig. 2, text fig. 18 (end of barbel). N. 6°40' W. 80°47', 3000 meters, Gulf of Panama.

Depth 6 1/2; head 4 3/4. Eye 6 1/2 in head; barbel 1 1/2 length of head, ending in small white bulb, with 2 slender filaments arising from base; terminal part of black part not swollen, bearing pair of small luminous organs.

Postocular luminous organ 1/2 eye. Lateral photophores 21 between gill opening and ventral, 15 between ventral and anal. Ventral series 11 between isthmus and pectoral, 20 between pectoral and ventral, 15 between ventral and anal, 17 (5+7) between anal and caudal.

D. 16, high, begins above ventrals and ends little before anal; A. 17; pectoral 8; ventral 7, median. Length 155 mm. without caudal.

(Regan and Trewavas.)

Gulf of Panama.

Genus Diplolychnus Regan and Trewavas

Diplolychnus Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 27. Type Diplolychus lucifer Regan and Trewavas.

Mouth cleft straight. Fangs moderate, erect maxillary teeth curved forward, 12 to 16 in adults. Teeth on gill arches well developed. Post ocular organ with 2 luminous surfaces, larger behind and smaller below eye, both sometimes connected by slender strip. Post-temporal replaced by strong ligament. Stomach large.

Analysis of species

a.[1] Hind part of postocular luminous organ long as eye; barbel 1/2 length of head, with 1 filament near end.

lucifer.

a.[2] Hind part of postocular luminous organ 1/2 of eye; barbel long as head, with 1 filament near end.

mononema.

a.[3] Hind part of postocular luminous organ 1/2 of eye; barbel little over 1/2 of head, with 2 filaments near end.

bifilis.

Diplolychnus lucifer Regan and Trewavas

Diplolychnus lucifer Regan and Trewavas, Danish Dana Oceanogr. Rep., no. 5, May 30, 1929, p. 28, pl. 5, fig. 1. N. 25°11' W. 20° 57', 1000 meters, Atlantic.

Depth 6 2/3; head 6. Eye 6 1/3 in head; barbel 1/2 head, black stem ending in swollen part, bearing pair of luminous bodies and followed by very small white tip 1/3 black swollen part, single very short filament near end.

Postocular part of luminous organ equals eye. Small oblong luminous patch just behind preopercle. Lateral photophores 22 between gill opening and ventral, 25 between ventral and anal. Ventral series 10 between isthmus and pectoral, 25 between pectoral and ventral, 25 between ventral and anal, 12 between anal and caudal.

D. 14, begins little behind ventral, ends far before anal; A. 16; pectoral 7; ventral 7, omedian. Length 245 mm. without caudal. (Regan and Trewavas.)

Atlantic.

Diplolychnus mononema Regan and Trewavas

Diplolychnus mononema Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 28, pl. 5, fig. 2. N. 17°43' W. 64°56', 1000 meters, Caribbean Sea west of St. Croix.

Depth 6; head 4 3/4 to 5 2/3. Eye 5 to 7 in head; barbel long as head, like D. lucifer except white tip longer, about equals black swollen part.

Postocular part of luminous organ 1/2 eye. Small oblong luminous patch just behind preopercle. Lateral photophores 22 to 25 between gill opening and ventral, 23 or 24 between ventral and anal. Ventral series 10 or 11 between isthmus and pectoral, 25 or 26 between pectoral and ventral, 22 to 25 between ventral and anal, 10 1/2 between anal and caudal.

D. 13, begins little behind ventral, ends far before anal; A. 16 or 17; pectoral 7; ventral 7, median. Length 255 mm. without caudal.

(Regan and Trewavas.)

Atlantic.

Diplolychnus bifilis Regan and Trewavas

Diplolychnus bifilis Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 28, pl. 5, fig. 3. N. 46°28' W. 8°1'; 4000 meters; off Ireland.

Depth 7; head 4 1/2. Eye 5 in head; barbel little over 1/2 of head, like D. mononema, but with 2 filaments.

Postocular part of luminous organ half of eye. Lateral photophores 22 or 23 between gill opening and ventral, 20 or 21 between ventral and anal. Ventral series 9 to 11 between isthmus and pectoral, 22 to 24 between pectoral and ventral, 20 or 21 between ventral and anal, 10 or 11 between anal and caudal.

D. 12, begins over or close behind ventral; A. 14 or 15; pectoral 7; ventral 7, median. Length 65 mm. without caudal.

(Regan and Trewavas.)

Atlantic.

Genus Heterophotus Regan and Trewavas

Heterophotus Regan and Trewavas, Danish Exped. Dana Oceanogr. Rep., No. 5, May 30, 1929, p. 28. Type Heterophotus ophistoma Regan and Trewavas, monotypic.

Mouth cleft somewhat curved, very wide. Teeth small, without well marked canines. Maxillary teeth erect, numerous (15 in young to over 40 in adult). Pair of teeth on vomer and series on each palatine. Gill arches with small teeth, usually in pairs, none on hyoid arch. No pokt-temporal. Stomach large. Photophores in ventral series mostly grouped into little series of subcontiguous photophores. Ventrals well postmedian.

Heterophotus ophistoma Regan and Trewavas

Heterophotus ophistoma Regan and Trewavas, Danish Dana Expedn. Oceanogr. Rep., No. 5, May 30, 1929, p. 29, pl. 6, fig. 1. N. 7° to 18° W. 32° to 79°, 600 to 2500 meters, Atlantic and Caribbean Sea.

Depth 4 3/4 to 6 4/5; head 3 3/5 to 4 4/5. Eye 5 to 8 in head; barbel 1/2 to long as head, slender, black, with white tapering tip, which not or but little swollen.

Postocular luminous organ close to eye, generally longer. Lateral photophores 33 to 36 between gill opening and ventral, 16 or 17 between ventral and anal, not in groups except 4 or 5 behind opercle. Ventral series 10 or 11 (1+2+3+4 or 1+3+3+4) between isthmus and pectoral, 32 to 35 between pectoral and ventral (linear groups 1 to 5), 14 to 16 between ventral anal (general posterior linear group 5 to 7), 13 or 14 between anal

and caudal with middle ones higher.

D. 13 or 14, begins above or just behind ventral, ends before anal; A. 14 to 17; pectoral 7; ventral 7, distant from caudal 1/2 to 2/3 that from snout end. Length 300 mm. without caudal.

(Regan and Trewavas.)

Atlantic.

Genus Rhadinesthes Regan and Trewavas

Rhadinesthes Regan and Trewavas, Danish Expedd. Dana Oceanogr. Rep., No. 5, May 30, 1929, p. 29. Type Astronesthes decimus Zugmayer, monotypic.

Body greatly elongate. Mouth cleft straight. Teeth in jaws unequal, with small curved fangs mixed with much smaller teeth. Premaxillaries probably extend nearly to mouth angle. Maxillary short, with minute, almost vestigeal teeth. Pair of teeth on vomer and series on each palatine. Teeth on gill arches small, in pairs, none on ceratohyal. Post-temporal present. Stomach large. Postocular luminous organ single.

Rhadinesthes decimus (Zugmayer)

Astronesthes decimus Zugmayer, Bull. Inst. Océanogr. Monaco, No. 193, 1911, p. 6.; Rés. Camp. Sci. Monaco, vol. 35, 1911, p. 80, pl. 3, fig. 6 (type from N. 44°24' W. 11° 36', 4900 meters).

Rhadinesthes decimus Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 29, fig. 20 (type).

Depth 11; head 6 1/2. Eye 6 1/4 in head; maxillary equals eye; longest fang 1/2 eye; barbel 1 1/2 head to bulb, stem black with luminous patches most developed near swollen end, which separated from bulb by constriction; bulb rounded, white, with 4 filaments arising together from base; lower jaw 9/10 of head.

Astronesthes lucifer Gilbert

Astronesthes lucifer Gilbert, Bull. U. S. Fish Comm., vol. 23, pt. 2, 1903 (1905), p.

Postocular luminous organ small, well separated from eye. An undulating white line along middle of side. Ventral photophores 6 between isthmus and pectoral, 26 between pectoral and ventral, 23 between ventral and anal, 15 between anal and caudal.

D. 12, inserted far behind ventral, ends far before anal; A. 19, ends at distance from caudal equal to its own base length; pectoral 7 or 8; ventral 8, nearly median. Length 315 mm. without caudal.

(Regan and Trewavas.)

Atlantic.

Genus Neonesthes Regan and Trewavas

Neonesthes Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 30. Type Neonesthes macrolychnus Regan and Trewavas, monotypic.

Body moderately long. Premaxillaries curved upwards in front and meeting at angle. Teeth in both jaws feeble. Maxillary teeth erect and similar to others. Pair of teeth on vomer and series of weak palatine teeth. Gill arches with numerous pairs of slender teeth, close set, much longer than jaw teeth, also similar series on ceratohyal. Post-temporal rather slender. Stomach rather small. Postocular luminous organ very large. Anal rays 25 to 28, ending near caudal.

Analysis of species

a.[1] Depth 5 to 6 3/4. macrolychnus.

a.[2] Depth 7. microcephalus.

Leonesthes macrolychnus Regan and Trewavas

Leonesthes macrolychnus Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 5, May 30, 1929, p. 30, pl. 6, fig. 2, text fig. 21 (end of barbel). N. 7° to 18° W. 32° to 79°, 600 to 2500 meters, North Atlantic. — Norman, Discovery Rep., vol. 2, 1930, p. 308 (S. 32° 45' W. 8° 47'; 650 meters).

? Astronesthes capensis Gilchrist and Von Bonde, Fisher. Marine Biolog. Surv. South Africa, Report No. 3, 1922 (1924), No. 7, p. 5. Off Table Bay, in 790 fathoms. — Barnard, Ann. South African Mus., vol. 21, pt. 1, June 1925, p. 134 (type).

A 12 86, 13531. Ubai, Bouro Island, Dutch East Indies. December 9, 1909. Length 90 to 290 mm. 3 examples.

13233. Doworra Island. December 2, 1909. Length 177 mm.

Depth 5 to 6 3/4; head 4 1/2 to 5 1/2. Snout short; eye 4 to 5 in head; barbel 3/5 to 1 3/8 of head, ending in swollen bulb, stem not heavily pigmented except small area carrying 12 white luminous organs immediately below bulb.

Postocular luminous body 3 to 5 in head, with narrow anterior suborcular prolongation mostly covered by pigment layer but exposed in front. Lateral photophores 13 to 15 between gill opening and ventral; 15 to 20 between ventral and anal. Ventral series 10 to 12 between isthmus and pectoral, 15 or 16 between pectoral and ventral, 16 to 19 between ventral and anal, 13 to 18 between anal and caudal.

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D. 10 to 12, short, above interspace between ventral and anal; A. 25 to 28; pectoral 8; ventral 7, premedian. Length 150 mm. without caudal.

(Regan and Trewavas.)

North Atlantic.

Neoneschus microcephalus Norman

Neoneschus microcephalus Norman,
Discovery Rep., vol. 2, 1930, p. 307,
fig. 16. S. 15° 55' E. 10° 35', 600 to 700 meters,
South Atlantic.

Depth 7; head 6 1/3. Snout 7 1/4 in
head from snout tip; eye 4, greater
than snout; maxillary extends 1 1/5
eye diameters behind eye, length 1 1/4
in head from snout tip; barbel
1 1/10 to 2 1/3 times head, hyaline stem
ending in swollen white bulb prolonged
terminally into fine filament and
collar of pigmented tissue round base
of bulb.

Postocular luminous organ 3 to 4 in head, with narrow suborbular prolongation more or less covered by pigment layer. Lateral photophores 14? between gill opening and ventral, 18.? between ventral and anal. Ventral series 9 or 10 between isthmus and pectoral, 16 or 17 between pectoral and ventral, 18 or 19 between ventral and anal, 12? between anal and caudal.

D. 10, short, above interspace between ventral and anal; A. 22 or 23; pectoral rays 8;

ventral rays 7, premedian.
Traces of ventral adipose fin.

Length 148 mm. (Norman.)

South Atlantic.